

are trained, and even the officers led by them, to commit useless destruction, combined with every conceivable atrocity on man, woman, and child. It is lamentable to think of the geological and natural-history collections which have been destroyed in Belgium alone—a country famous for its scientific men, the work of their lives gone for ever. I trust all this will not be forgotten when the war is fought out to a proper issue, and that all Lord Walsingham suggests will come about and just punishment be thus meted out.

The German scientific man has been spoilt by success in the past; he was first in the field in many countries, particularly our own. I knew him in days gone by in India, when he filled the best appointments in the Geological Survey, the Forestry Department, etc. Many were friends of my own. In those days they were quite different men in every way from those of to-day so complete a change has come over the whole German population. It is sincerely to be hoped they will never be employed again in any capacity.

H. H. GODWIN-AUSTEN.

Nore Godalming, September 17.

The South Georgia Whale Fishery.

A NOTE on p. 470 of NATURE for August 15 contains the statement that scientific experts have, until now, not been consulted in the matter of the South Georgia whale fishery, which has been administered entirely by the Colonial Office. There is at present a considerable tendency to criticise Government Departments for failing to make use of scientific opinion, but I feel sure that you will allow me to point out that this particular criticism is not justifiable. The Colonial Office has for some years been fully alive to the fact that the regulation of sub-Antarctic whaling is a scientific problem, and since 1910 it has been in constant communication on the subject with the Natural History Museum. Under arrangements thus made the museum receives detailed statistics from the companies operating at South Georgia, each individual whale caught being separately recorded. Similar statistics are beginning to come in from the South Shetlands (a district almost as important as South Georgia) and from some of the African companies; while promises of returns from other whaling centres have also been received. In addition to this, the Colonial Office furnishes half-yearly and other reports on the whaling operations at the districts under its jurisdiction, and it has received many reports from the museum commenting on the facts thus recorded, and offering advice on the various questions raised.

In the course of 1913 the Colonial Office proposed that a biologist should be sent to South Georgia to take investigations which might contribute towards the solution of the whaling problem. In consultation with the museum, the work was offered to Major G. E. H. Barrett-Hamilton, who accepted the task, and reached South Georgia in November, 1913. News of his untimely death, on January 17, 1914, while strenuously occupied with his observations on whales, was shortly afterwards received in London. The manuscript notes which he left behind show that the investigation had been placed in most competent hands, and they have formed the basis of an important report, which is at present under consideration at the Colonial Office. The appointment of Major Barrett-Hamilton had been made as an initial step in a much larger scheme for the investigation of the problems connected with whaling by means of a scientific station to be established for several years on the Antarctic continent. The preparations for carrying out this idea were interrupted by the war.

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That the urgency of the question was recognised by Government Departments, and that the need for obtaining scientific opinion was felt, was further shown by the appointment of an Inter-Departmental Committee on Whaling and the Protection of Whales. In August, 1913, the Colonial Office wrote to the Natural History Museum asking for information with regard to the scientific aspects of whaling for the use of this Committee, and a memorandum on the subject was submitted by the museum in due course. The Committee was engaged in hearing evidence during the first half of 1914, but its labours were discontinued on the outbreak of war.

Early in the present year a new Committee was appointed to facilitate prompt action at the conclusion of the war in regard to the preservation of the whaling industry in the Dependencies of the Falkland Islands. This Committee, on which the Natural History Museum is represented, is actively engaged in collecting information, under the auspices of the Colonial Office.

It is sometimes assumed that expert scientific advice is capable of settling any difficult question which may arise within its own province. The solution of the problem of protecting whales is, however, no easy matter; and I doubt whether there is at present unanimity on the subject among scientific experts. The trustees of the British Museum have for some years been convinced of its importance and urgency, and they have welcomed the opportunities afforded them by the Colonial Office of expressing their views and tendering their advice, based on the study which has been given to the subject in the museum. Assistance from those competent to give it would be cordially received, and I am glad to have this opportunity of inviting scientific experts to communicate their views on the protection of whales to the Natural History Museum, and thus to assist in a matter which is not only of great zoological interest, but also one which may be described without exaggeration as of supreme national importance.

SIDNEY F. HARMER.

British Museum (Natural History),
Cromwell Road, S.W.7.

Vitality of Gorse-seed.

ASSERTIONS regarding the length of vitality of certain seeds are frequently made, but these, when investigated, often lack proof. Hence it may be worth while to put on record a clear case of the seeds of the gorse (*Ulex europaeus*) retaining their germinating power for twenty-five years.

Some forty acres of gorse- and heather-covered land situated near my home in the plain of Cumberland were drained, cleaned, and ploughed out in 1893. This area was kept in arable rotation for a number of years; then part of it was laid down in grass in 1904, and the remainder in 1906. It soon became evident that this new pasture would rapidly revert to a gorse-covered common unless drastic measures were taken to rid the ground of the numerous gorse seedlings, which had sprung up from the seeds brought to the surface by the last ploughing. These were stubbed out, and in two or three years' time the ground was entirely free of gorse plants, and has continued so for the ten or more years it has been allowed to remain in permanent pasture.

Last winter this land was again brought under the plough by order of the local War Agricultural Committee, and was sown with oats. The crop has now been reaped, and gorse seedlings, 6 in. or more in height, are to be seen scattered over the stubble, being especially abundant where originally the gorse grew strongest. Evidently, then, the last ploughing has

brought to the surface a fresh lot of seed which, though having lain buried in the soil for a quarter of a century, has retained its germinating capacity.

JOHN PARKIN.

The Gill, Brayton, Cumberland,
September 9

Rock-disintegration by Salts.

THE reference in NATURE for September 19, p. 50, to Mr. J. T. Jutson's paper dealing with the influence of the crystallisation of soluble salts in promoting the weathering of rocks reminds me of Il Fungo, an isolated mushroom-shaped rock opposite Lacco Almeno, on the north shore of Ischia. Formed of porous volcanic tuff, the sea-water rapidly ascends by capillarity, and, being evaporated, large crystals of salt are produced on the face of the rock. As these natural processes are most active over an area about midway between the sea and the summit, the sides there are being hollowed out very rapidly, large flakes of rock constantly falling.

In 1892 the late Dr. Johnston-Lavis gave me a photograph of, and much valuable information respecting, this rock.

C. CARUS-WILSON.

September 20.

GERMAN INDUSTRY AND THE WAR.

I.

A RECENT issue of the Bulletin de la Société d'Encouragement pour l'Industrie Nationale¹—the French counterpart of our Journal of the Society of Arts—contains two interesting and important articles on the present and future influence of the war on German industry, written by MM. Jaureguy, Froment, and Stephen, which make known a number of facts concerning the means by which Germany has attempted, with more or less success, to evade efforts to isolate her during the war. In spite of the rigour of the blockade to which she has been subjected, there can be little doubt that, thanks to the knowledge, skill, and ingenuity of her chemists and engineers, encouraged and aided financially by the State, she has hitherto managed to provide herself with the means of carrying on the war—not only as regards munitions, in which she has been eminently successful, but also in regard to the alimentation of her people, in which, of course, owing to the complexity of the problem and to natural conditions beyond her control, her success has been less conspicuous. The new industries which have been created, and the great development of those already in existence, would, apparently, enable Germany to prosecute the war almost indefinitely. The determining factors will be the exhaustion of her man-power and the gradual weakening of her moral. Both these causes are beginning to tell, and it is abundantly evident from a variety of signs that the Higher Command is realising that the rot has set in. Junkerdom is now fighting only for its existence. The steady and persistent pressure of the Allies will accelerate the advent of the inevitable *débâcle*. The end will come when the remnants of the German armies are driven back to the Rhine.

¹ Bulletin de la Société d'Encouragement pour l'Industrie Nationale, 129, 416. (Paris, 1918.)

In the meantime it is instructive to note what Germany is doing in her efforts to stave off the disaster which assuredly awaits her. It is always wise to learn from your enemies when you can, and Germany has much to teach us concerning the manner in which Science may be made subservient to War and to the conditions which war produces.

We have already dwelt, on former occasions, on the importance of the nitrogen problem in the war, and have given some account, in the light of such information as was available, of the methods by which Germany has attempted to solve it. The communication before us contains a number of statistical statements respecting the development and present position of the several synthetic processes of utilising atmospheric nitrogen which are of interest at this present juncture. It appears that the Birkeland-Eyde process, which in 1913 furnished Germany with some 5000 tons of calcium nitrate from the Norwegian factories still worked to a limited extent in Saxony, where a manufactory was established before the war at Muldenstein, employing lignite as a source of power. Ostwald's process of oxidising ammonia catalytically—or rather the Frank-Caro modification of it—is in operation at Spandau, Höchst, Griesheim, and at works belonging to the Badische Aniline Company. Kayser, at Spandau, employs apparatus capable of oxidising 370 kilos. of ammonia in twenty-four hours with a yield of from 90 to 95 per cent. The Badische Company makes use of plant constructed by the Berlin-Anhaltische Maschinenbau, oxidising about 750 kilos. of ammonia in twenty-four hours. The heat furnished by the reaction suffices to maintain the catalyser at a constant temperature of 700° C. The main catalytic agent is said to be one of the oxides of the iron group containing bismuth or one of its salts. During 1915 some thirty installations of this system were erected, each capable of oxidising more than 12 million kilos. of ammonia annually. In the more recent forms of the apparatus the yield has been increased to 17 million kilos. Before the war the main source of supply of ammonia was from coke-ovens and from the gasworks, which in the aggregate furnished about 500,000 tons of sulphate of ammonia, of which agriculture absorbed 450,000 tons.

The Haber process of combining nitrogen, obtained by the fractional distillation of liquid air, with hydrogen procured by the electrolysis of water, as worked out by Bosch and Mittasch, chemists of the Badische Company, was already in operation before the war, but has now been greatly extended. The factory at Oppau has been much enlarged at the Government expense, and other factories have been erected. The capital of the Badische Company has been increased from 14 to 90 million marks. The firms of Bayer, Meister Lucius, Casella, Weiler-Termeer, Kalle, and the Griesheim-Elektron Company have also augmented their capital, and are work-